



**RE: TESTING OF SAMPLES OF SOLENO (Hagersville) 525 mm (21") Type  
S non-perforated POLYETHYLENE PIPE TO AASHTO M294 FOR THE  
ESC PROGRAM**

CONDITIONING: Not less than 24 hours at 23±2° C (73°F)

TEST RESULTS:

**SECTION 6.1 - BASIC MATERIALS**

	DENSITY (g/cc)	MELT INDEX (g/10 min.)	CARBON BLACK (%)
TRI Environmental	0.950	0.145	2.60
Solen	0.948	0.187	2.69

SPECIFICATION: Min Cell Class 335400C w/SP-NCTL @ 15% of 24 hr  
Density .945 to .955 g/cc  
Melt Index 0.15 to 0.40 g/10 min.  
Pipe Carbon Black Content 2% min. / 5% max.

CONCLUSION: Specification is met.

**SECTION 7.1 - WORKMANSHIP**

	RESULT
TRI Environmental	pass
Solen	pass

SPECIFICATION: Pipe shall be free of foreign inclusions and visible defects. The inner liner shall be fused to the outer corrugated shell at all internal corrugation crests.

CONCLUSION: Specification is met.

**SECTION 7.2 – PIPE DIMENSIONS**

**SECTION 7.2.2 – WALL THICKNESS**

	WALL THICKNESS	WALL THICKNESS SPECIFICATION
TRI Environmental	0.072	>0.060
Solen	0.065	

SPECIFICATION: The inner wall shall have the specified minimum thickness.

CONCLUSION: Specification is met.

## **SECTION 7.2 – PIPE DIMENSIONS (con't)**

### **SECTION 7.2.3 – INSIDE DIAMETER**

	INSIDE DIAMETER	TOLERANCE
TRI Environmental	21.0 in	20.4 – 21.6 in
Soleno	20.9 in	

SPECIFICATION: The tolerance on the specified inside diameter shall be 4.5% oversize and 1.5% undersize, but not more than 37 mm oversize.

CONCLUSION: Specification is met.

### **SECTION 7.4 – PIPE STIFFNESS**

	ORIENTATION	MEASURED PIPE STIFFNESS – kPa (psi)	MINIMUM PIPE STIFFNESS
TRI Environmental	0/45/90	386/421/421(56/61/61)	260 kPa (38 psi)
Soleno	0/45/90	352/372/375(51/54/54)	

SPECIFICATION: Minimum pipe stiffness at 5% deflection as specified.

CONCLUSION: Specification is met.

### **SECTION 7.5 – PIPE FLATTENING**

	RESULT
TRI Environmental	pass
Soleno	pass

SPECIFICATION: There shall be no evidence of buckling, cracking, splitting or delamination when the vertical inside diameter is reduce by 20%.

CONCLUSION: Specification is met.

### **SECTION 7.6 – ENVIRONMENTAL STRESS CRACKING**

	RESULT
TRI Environmental	pass
Soleno	Not performed on sample

SPECIFICATION: There shall be no cracking of the pipe.

CONCLUSION: Specification is met.

**SECTION 7.7 – BRITTLENESS**

	RESULT
TRI Environmental	pass
Soleno	pass

SPECIFICATION: Pipe specimens shall not crack or split. Five non-failures out of six impacts will be acceptable.

CONCLUSION: Specification is met.

**SECTION 7.8 – FITTING REQUIREMENTS (JOINT INTEGRITY)**

	RESULT
TRI Environmental	pass
Soleno	pass

SPECIFICATION: Pipe connections shall not separate to create a gap exceeding 5 mm when measured between the bell and spigot portions of pipe. Fittings shall not crack or delaminate.

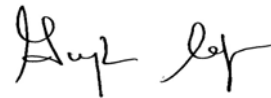
CONCLUSION: Specification is met.

**SECTION 11 – MARKING**

	MFG	SIZE	PLANT CODE	PRODUCTION DATE/CODE
TRI Environmental	soleno	525 mm (21")	HA	n/a
Soleno	soleno	525 mm (21")	HA	05/mar/17

SPECIFICATION: Pipe and fittings shall be clearly marked at intervals not more than 3.5m with manufacturer's name or trademark, nominal size, designation AASHTO M294, the plant designation code and date of manufacture or appropriate code.

CONCLUSION: Specification is met.



Guylaine Chayer,  
Director, Quality Assurance